TxDOT Equipment Replacement Model

T E R M

The Texas Department of Transportation (TxDOT) utilizes a uniform process in its approach to determine equipment replacement criteria. The department owns and maintains an active fleet of approximately 16,000 units to serve approximately 80,000 centerline miles which are miles traveled in a one-way direction regardless of the number of lanes. TxDOT annually disposes of approximately ten percent of its fleet.

To meet the diverse geographical conditions and program needs in the State of Texas, the TxDOT fleet ranges from compact sedans to motorized ferries. The department consists of twenty-five districts and twenty-six support divisions/offices. Each district receives an annual allocation for equipment purchases. District management is responsible for specific needs, and most utilize equipment committees to assist in identification of equipment as candidates for replacement.

TxDOT continually evaluates the suitability of units in its fleet based on age, miles (or hours) of operation, downtime, as well as operating and maintenance costs. Some of the evaluation is performed subjectively through input from equipment, maintenance, and field personnel.

Prior to implementation of the TxDOT Equipment Replacement Model (TERM) in 1991, an extensive search of printed material and software was made. Also, state highway departments were contacted to determine if an automated method of identifying equipment as a candidate for replacement was in use. While various methods were being used, most employed schedules/benchmarks for classes of equipment based on the criteria of age and usage, and included life repair costs, as well as the equipment's condition.

TxDOT Equipment Replacement Model (TERM) was developed to identify equipment items that were candidates for equipment replacement. This was a result of an internal audit recommendation and review of replacement methodologies.

Actual Model *— The logic is that each equipment item reaches a point when there are significant increases in repair costs. Replacement should occur prior to this point. Ad hoc reports were developed and are monitored annually to display historical cost information on usage and repairs to identify vehicles for replacement consideration. From this historical information, standards/benchmarks for each criteria are established for each class of equipment.*

TxDOT's Equipment Operations System (EOS), a subsystem of the department's Management Information System (MIS), in operation since 1984, captures extensive information on all aspects of equipment operation. This system is used to provide historical data in a computerized approach. Due to the complexity of the equipment replacement decisions, TxDOT chose to keep the philosophy and logic relatively simple. EOS historical cost data is processed against three preset standards/benchmarks for each identified equipment class. The criteria used in the approach are 1) equipment age, 2) life usage expressed in miles (or hours), and 3) life repair costs (adjusted for inflation) relative to original purchase cost (including net adjustment to capital value). Example: A light duty truck, 4600-6199 lb. GVWR, State Series 861c, that is nine years old, has accumulated 110,000 miles of usage, and whose life repair costs have exceeded one hundred percent of the original purchase cost, including net adjustments to capital value, meets all three criteria.

The resulting report provides information to manage equipment replacement and to plan for future needs. This approach identifies equipment meeting specified criteria one year in advance of the actual time that a replacement is required. This allows sufficient time for the procurement and delivery of a new unit.

TERM is only one tool in the overall decision making process. It does not replace the knowledge of the equipment manager, but only serves to supplement it. Consequently, as equipment budget constraints are realized, this requires each district to prioritize equipment replacement relative to their needs and approved budget funding. Accordingly, each district considers this information, downtime, condition of existing equipment, new equipment needs, identified projects, and other factors when planning equipment replacement.

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TEXAS DEPARTMENT OF TRANSPORTATION EQUIPMENT REPLACEMENT MODEL (TERM)

The Texas Department of Transportation Equipment Replacement Model (TERM) uses historical data to identify vehicles for replacement. Early identification, a process that takes approximately one year, allows the districts time to identify vehicles for replacement; budget for replacement; develop specifications; advertise and award the purchase bid; and allows the vendor opportunity to build and deliver the vehicle.

SERIES (EXAMPLES)	TxDOT CLASS CODE	DESCRIPTION	GVWR LBS	USAGE (MILES)		AGE		REPAIR
				STANDARD	AT DISPOSAL	STANDARD	AT DISPOSAL	
372B, 373B, 374C, 341ALT, 359A, 360B	20020, 20030, 25010	AUTOMOBILES, SEDAN, OR STATION WAGONS	N/A	90,000	100,000	8 YRS	9 YRS	75%
	400020	TRUCK, 4 -WHEEL DRIVE PICKUP, ALL STYLES	N/A	110,000	130,000	9 YRS	10 YRS	100%
665C	400010	TRUCK, 4 -WHEEL DRIVE UTILITY AND CARRYALL	N/A	110,000	130,000	9 YRS	10 YRS	100%
661B, 662B, 663B	400030	TRUCK, 2 -WHEEL DRIVE UTILITY VEHICLE	3,961-5000	110,000	130,000	9 YRS	10 YRS	100%
843B, 844B	430050	TRUCK, EXTENDED CAB COMPACT	4,245-5,034	110,000	130,000	9 YRS	10 YRS	100%
842B	430040	TRUCK, HEAVY DUTY COMPACT	4,320-5,600	110,000	130,000	9 YRS	10 YRS	100%
855B, 861C	430020	TRUCK, LIGHT DUTY, PICKUP	4,600-6,199	110,000	130,000	9 YRS	10 YRS	100%
861C	430030	TRUCK, LIGHT DUTY, PICKUP, OTHER BODY STYLES	4,600-6,199	110,000	130,000	9 YRS	10 YRS	100%
862C, 863C	430070	TRUCK, EXTENDED CAB 1/2 TON	6,000-6799	110,000	130,000	9 YRS	10 YRS	100%
668B, 741B	420010	TRUCK, CARGO OR WINDOW VAN, MINI	TO 6,200	110,000	130,000	9 YRS	10 YRS	100%
670C, 680C, 685C, 687D, 750C, 755C, 760C, 770D	420020	TRUCK, CARGO OR WINDOW VAN, FULL-SIZE	6,200+	110,000	130,000	9 YRS	10 YRS	100%
864C	440010	TRUCK, LIGHT DUTY, PICKUP	6,200-7,999	110,000	130,000	9 YRS	10 YRS	100%
864C	440020	TRUCK, LIGHT DUTY, PICKUP, OTHER BODY STYLES	6,200-7,999	110,000	130,000	9 YRS	10 YRS	100%
868C/D, 869C/D	440030	TRUCK, EXTENDED CAB 3/4 TON	6,800-9,000	110,000	130,000	9 YRS	10 YRS	100%

SERIES (EXAMPLES)	TxDOT CLASS CODE	DESCRIPTION	GVWR LBS	STANDARD	AT DISPOSAL	STANDARD	AT DISPOSAL	REPAIR
650C	410010	TRUCK, CARRYALL	TO 6,950	110,000	130,000	9 YRS	10 YRS	100%
655C	410020	TRUCK, CARRYALL	7,000+	110,000	130,000	9 YRS	10 YRS	100%
	470020	TRUCK, LIGHT DUTY, CREW CAB, ALL BODY STYLES	7,901-8,599	110,000	130,000	9 YRS	10 YRS	100%
	450010	TRUCK, LIGHT DUTY, PICKUP BODY	8,000-8,599	110,000	130,000	9 YRS	10 YRS	100%
	450020	TRUCK, LIGHT DUTY, OTHER BODY STYLES	8,000-8,599	110,000	130,000	9 YRS	10 YRS	100%
870C/D, 872C/D, 875C/D, 876C/D	460020	TRUCK, LIGHT DUTY, OTHER BODY STYLES	8,600-14,999	110,000	130,000	9 YRS	10 YRS	100%
866D, 872C/D, 876C	460010	TRUCK, LIGHT DUTY, PICKUP BODY	8,600-14,999	110,000	130,000	9 YRS	10 YRS	100%
866D, 881C/D, 882C/D, 886C/D, 887C/D, 888C/D	470030	TRUCK, LIGHT DUTY, CREW CAB, ALL BODY STYLES	8,600-14,999	110,000	130,000	9 YRS	10 YRS	100%
875C/D, 876C/D	480010	TRUCK, PLATFORM, PLATFORM DUMP, STAKE	8,600-14,999	110,000	130,000	9 YRS	10 YRS	100%
930D/G, 940D/G	490010	TRUCK, LIGHT/MEDIUM DUTY	14,500-18,999	110,000	130,000	9 YRS	10 YRS	100%
940D/G	500010	TRUCK, ALL BODY STYLES	15,000-18,900	130,000	140,000	10 YRS	11 YRS	100%
950D/G	510010	TRUCK, ALL BODY STYLES	19,000-20,900	130,000	140,000	10 YRS	11 YRS	100%
960D	520020	TRUCK, CONVENTIONAL DUMP	21,000-25,400	130,000	140,000	10 YRS	11 YRS	100%
960/D/G	520030	TRUCK, EJECTION TYPE MATERIAL BODY	21,000-25,400	130,000	140,000	10 YRS	11 YRS	100%
960D/G	520010	TRUCK, ALL BODY STYLES, EXCEPT CONVENTIONAL DUMP	21,000-25,400	130,000	140,000	10 YRS	11 YRS	100%
970D, 980D, 981D	530010	TRUCK, ALL BODY STYLES, EXCEPT CONVENTIONAL DUMP/WRECKER	25,500-28,900	130,000	140,000	10 YRS	11 YRS	100%
970D/G, 980D/G, 981D	530020	TRUCK, CONVENTIONAL DUMP	25,500-28,900	130,000	140,000	10 YRS	11 YRS	100%
985D, 990D	530030	TRUCK, EJECTION TYPE MATERIAL BODY	25,500-38,900	120,000	130,000	10 YRS	11 YRS	100%
985D, 990D	550010	TRUCK, ALL STYLES EXCEPT DUMP, SINGLE REAR AXLE	29,000-38,900	140,000	150,000	16 YRS	17 YRS	100%
990D	540010	TRUCK, DUMP, SINGLE REAR AXLE	29,000-42,900	140,000	150,000	16 YRS	17 YRS	100%

SERIES (EXAMPLES)	TxDOT CLASS CODE	DESCRIPTION	GVWR LBS	STANDARD	AT DISPOSAL	STANDARD	AT DISPOSAL	REPAIR
	550020	TRUCK, ALL STYLES EXCEPT DUMP, TANDEM REAR AXLE	39,000+	140,000	150,000	16 YRS	17 YRS	100%
1000D	540020	TRUCK, DUMP, TANDEM REAR AXLE	43,000+	180,000	200,000	16 YRS	17 YRS	100%
	600010	TRUCK TRACTOR, SINGLE REAR AXLE	TO 60,000 GCWR	140,000	150,000	16 YRS	17 YRS	100%
1100D	600020	TRUCK TRACTOR, SINGLE REAR AXLE	60,000+ GCWR	140,000	150,000	16 YRS	17 YRS	100%
1200D	600030	TRUCK TRACTOR, TANDEM REAR AXLE	ALL GCWR	200,000	250,000	16 YRS	17 YRS	100%